TWO ENTOMOLOGISTS IN THE MALLEE.

By C. OKE.

(Read before the Field Naturalists' Club of Victoria, March 8, 1926)

My friend, Mr. J. E. Dixon, had often told me about the thick Mallee scrub along the railway line between Gypsum Siding and Bronzewing, which he had noted as very promising beetle-country, while returning from his numerous visits to Lake Hattah. So, when he asked me to visit Gypsum for a week or two I was very pleased to accompany him.

Leaving Melbourne by the 5.16 p.m. Mildura train on October 31, 1924, we arrived at Gypsum (274 miles) about 5 o'clock next morning. There is no station at Gypsum, merely a siding for the loading of gypsum, or kopi, which occurs freely in the neighbourhood. On the rare occasions when a lady passenger wishes to alight from the train, a short ladder is produced, but a man has to drop off as best he can.

It was still too dark for us to see our way about, so we sat on our packs and waited—not long—for daylight. What a paradise was revealed at dawn. All around was a dense growth of Mallee and shrubs, including the scrubby Mallee Pine, Hakea, Grevillea (3 sps.), Acacia, Cassia, and, in parts, patches of *Calytrix tetragona*, which was blooming to perfection. Bushes with dark-pink and pure white flowers were growing side by side, and, in places, intertwined so that it seemed impossible that any constituent of the soil had helped to produce the colour of the blossoms. Though, where growing on the white sandy ridges, most of the plants had white flowers, an occasional plant having deep pink flowers was met with even there.

We strolled along the railway line, then followed a foot-track into the scrub. We soon came across some *Leptospermum* in flower, and commenced to look for beetles. The first species to be taken was *Stigmodera eldui*, and soon afterwards *S. elongatula* and *S. vittata* were found. A strong smell was traced to its source—a long-dead fox—which was turned over with a stick. Underneath were two species of Carrion-schafers, *Trox australasiæ* and *T. velutinus*, and a pair of that weeping lover of bad smells, *Ptomaphila lachrymosa*. His "tears" are more evident than those of the crocodile, being little, black, raised spots on the reddish wings, which bear a somewhat fanciful resemblance to tears. I had

thought to get some Staphs. on this carrion, but failed to find a sign of them.

Not far from the fox I noticed some ants running across the track, and, as they looked familiar, I picked up one, and at once recognised it by its sweet odour as *Iridomyrmex nitidus*. By following the ants the nest was soon discovered in some sticks and a stump. Lacking a tomahawk, I had to be content with a look around the sticks. However, I was fortunate in finding a nice little Staphylinid, *Dabia nitida*, Lea. This insect, although it closely resembles the other species of *Dabia*, can hardly remain in that genus, as characterised by Olliff, as none of its antennal joints are transverse. As it was impossible to break open the sticks, the direction of the nest was marked on the track with the intention of working it another time. Unfortunately, this was not done, so its treasures remained ungathered.

As accommodation is not procurable at Gypsum, we had brought a tent. A camp site opposite the 274-mile post was selected. This we thought to be the best spot, as it was near the "station," and right in the scrub and collecting ground, but we had to walk a mile for a billy of water. Still, to camp at the "tank" meant to be on cleared paddocks. The drawback in being so far from water was the lateness of morning and evening meals, the midday "snack" being eaten in the scrub, without a drink. Of course, a couple of miles' straight walking is not far, but we persistently took "short cuts" through the Mallee. Here the temptations to delay were innumerable, and the going was very slow. As a matter of fact, some of the best beetles of the trip were taken while we were "running the billy." Perhaps the finest species taken at Gypsum was *Carenidium superbum*, Cast. This is a large black Carab, an inch and a quarter in length, with a decided waist, and having beautiful purple reflections on the upper surface, and greenish around the margins. I caught this beetle while returning with the morning supply of water, and, in the excitement of the chase, upset the billy, and had to return to refill it—about three-quarters of a mile. We had a late breakfast that morning! Another fine Carab, found on the way to the tank, was *Carenum imitator*, Sl. This insect is about an inch in length, black, with pronotum and elytra green. Yet another species, found under a Mallee-root, was a pretty colour variety of *Carenum anthracinum*, Macl. This specimen was black, the elytra with violet and bronze reflections, and a narrow green margin.

On the second evening, while going for water, I turned over a piece of wood, and, seeing that it covered a nest of

Iridomyrmex rufoniger, an ant that is the "host" of many "guests," I searched carefully all around the nest. Very soon I found a small guest. Later I had the pleasure of seeing a second specimen in one of the little runnels of the nest; it had apparently been hiding under some rubbish in the nest, and was now making its way underground. These beetles proved to be the greatest treasures of the trip. They belong to the family Pselaphidæ, but are very distinct from any species known to me in nature or description. I have named the species *Malleecola myrmecophila* (M.S.)—the ant-loving dweller of the Mallee. It is about 2¼ mm in length, and of a pale castaneous colour. The head has a number of carinæ, or raised ridges, which divide it into distinct areolets. There is a wedge-shaped projection through the hind margin of the eye, the latter being unusually prominent. The antennæ are eleven-jointed, but the ninth joint, though wide, is so thin, and closely applied to the tenth, that it might easily be overlooked. The prothorax has three longitudinal carinæ and peculiar wing-like flanges on the sides. The legs are also very unusual for a Pselaphid, being flattened sideways and angular, somewhat as in the Histerid genus, *Chlamydopsis*.

While I was getting these new beetles Mr. Dixon found another nest of *Iridomyrmex* under an old bag, and in this several specimens of *Paussoptinus laticornis*, Lea, were found. This species has, I believe, only been recorded as an inquiline of *Iridomyrmex nitidus*, an ant with which I have not found it associated; but we found it here (and also at Bendigo) with two other species of that genus, viz., *I. rufoniger* and *I. gracilis*. Mr. A. M. Lea considers this to be the finest species of Ptinidæ in Australia, and I agree with him. It is a beautiful little beetle, especially when alive, and running around, waving its wide, but flattened, antennæ from side to side, or up and down. It would be tiresome to give the details of each day's work. I say work, for, believe me, we worked. This was no loafing holiday, but a continued hunt for beetles.

The camp was situated on a dull-red, sandy flat, through which shallow trenches had been dug in all directions, in the search for "Kopi," which is whitish, and occurs in "pockets" all over the flat. Gypsum crystals occur in small patches, but not very freely. In all directions sand ridges are seen, some large, others small. A series of ridges, about half a mile on the Brownzewing side, seemed to us to be particularly inviting, and here we spent many delightful hours.

The vegetation around the camp consisted of two species of Mallee, hundreds of very small Murray Pines, with an occasional large one, "Turpentine bush," Hakea, Grevillea,

Acacia, and that abomination of the Mallee country—Porcupine Grass. This last is a continual source of annoyance when one is collecting, and makes the wearing of leggings almost a necessity. Several times, when chasing flying insects, I came in violent contact with clumps of *Triodia*, some of the points piercing my legs. These points snap off—pieces about one-eighth of an inch in length—and cause irritation of the skin; when fresh, they are rather difficult to remove. The best plan is to leave them for a few hours, when the flesh about them begins to fester. They are then easily pressed out between finger and thumb, and the sores heal as quickly as they developed.

There was a fair amount of animal life on the flat, though it consisted mostly of small insect forms, ants (in particular) and spiders predominating. The exceptions in size were Emus. Several were seen, sometimes together, sometimes solitary. Twice I saw a bird, probably the same one, with chicks. A pair of Butcher-birds, *Cracticus torquatus*, had their nest within a dozen paces of the "station" camp. The young birds were able to fly fairly well, but were just learning the art of whistling, and very amusing they were in their attempts to imitate their parents, breaking off in the middle of a call, and looking around in a startled way, as though afraid of their own temerity. Two or three of them were often to be seen in a large Pine tree, having choral practice, and apparently chiding one another on their vocal powers. Two species of Wren-warbler, not found in the Melbourne district, were to be seen flitting among the scrub, but more often around the *Calytrix tetragona*; they were the Black-backed, *Malurus melanonotus*, and the Purple-backed, *M. assimilis*. The former, a beautiful study in blue and black, was as confiding as its congener, *M. cyaneus*, which is so plentiful in some places near Melbourne. The Purple-backed Wren-warbler, which is so easily distinguished by the reddish patch on the body around the wings, appears to be very shy, and takes flight on the slightest movement near it.

Spiders, as I have already said, were numerous, and trap-doors were plentiful all over the flat. But nearly all of them were owned by Wolf-spiders—Lycosidæ. In fact, I succeeded in finding only one belonging to one of the true Trap-door Spiders—Aviculariidæ—and this was quite small. There are two species of Lycosidæ inhabiting trap-door nests here. One is of a dingy grey-brown colour, the other appears (the appearance is entirely due to the hairs with which it is clothed) to be a pretty, silvery-grey, with distinct black stripes. The latter is the more common of the two. It is

amusing to walk quietly around, keeping a sharp look-out for insects on the ground, and see the lids being pulled down by the spiders inside, or, again, just to catch a sense of movement in a certain spot, and rush forward expecting to see some insect, and find—nothing! And very careful scrutiny of the spot, as a rule, is needed to locate the "door." It is surprising how quickly these spiders race across the ground, jump into their holes, and close the doors behind them. To what cause is this remarkable habit attributable? If it is really a habit developed from the blind instinct of self-preservation, then I certainly think that wasps must have been the enemies most dreaded. But we were too early in the season to see those interesting insects at work.

I found a most remarkable piece of work done by one of these spiders beside the railway line. The gangers had been cutting out some rotting sleepers, and had thrown them beside the line. On turning over one piece I noticed a large female Wolf-spider. She was in a defensive attitude, in a small, round chamber, much as there is at the bottom of a tunnel from a trap-door, but there was no apparent exit. I could detect no means whereby she could leave her retreat, so I carefully replaced the log, and searched all around it for the exit, but still without success. I then raised the sleeper on its side again, and looked underneath. Ah! There it was! Straight over the spider was the pin-hole for bolting down the rail, but, looking up the hole, I noted the light was not visible through it, as is usually the case. So I looked along the top, but failed to see the "door," and it was only after pushing a twig through the hole and opening the "door" that way, that I could be sure of seeing it. Where the hole had been made, there was a small ridge on the sleeper, and this had been carefully carried across the "door" by the spider. Was this merely blind instinct? Everyone must know, or can imagine, the splintery appearance of an old sleeper. Well, this had been imitated to a nicety, and the Mallee red dust had fallen on it and completed the work of this master craftsman.

Around the camp a few Carabs were taken, including: *Eurycaptus diladatus*, Macl., *Carenum cordipenne*, Sl. (one was taken from a burrow nearly three feet in length), *C. elegans*, Macl., *Ceratulus semiviolacea*, Cast., and *Sarticus dixoni* Sl. Beating the flowering Mallee, we obtained comparatively few beetles; still two good species of Stigmodera were obtained by this means, *Stigmodera moribunda*, Bl., and *S. signata*. The Leptospermum, as usual, proved better, and from it we obtained *Stigmodera vittata*, *elongatula*,

elderi, octospilota, argillacea, cyanicollis, amphichroa and *aneicornis*. Of these, *argillacea* is probably the prettiest, with its coppery thorax, which is margined with yellow, the wing-cases pale reddish, with blue markings. It is close to *octospilota* in markings (but not colour) and outline, but the apices of the elytra are distinct, much as in *elderi*. Other beetles taken here were a few Clerids and Malacoderms; among the latter was a new *Hypattalus* (but as it is a female it will have to stand over) and *Metriorrhynchus occidentalis*, Blkb., which was "new" to me. Some beetles occurred in great numbers, particularly certain of the small weevils, Chrysomelids and Anthicids. The Calytrix had very few beetles on it—a few small species that were common on anything; but one pretty exception was *Aonychus hopei*, a beautiful little weevil, with patches of pure white scales.

Each day a visit was paid to one of the sand ridges, and here we did better with the flower-frequenting beetles, especially on the Leptospernum, which grows much more freely on the sand ridges than on the flats. From this we took four species of *Melobasis*, viz., *purpurascens*, *fulgurans* (several varieties), *cuprifera* and *gratiosissima*, the majority of the last-named species being very fine, large specimens. *Fulgurans* and *gratisissima* were both very lively, and it was almost useless to use the umbrella for them, as they flew off almost before touching it; so picking them off the flowers had to be resorted to. A few longicorns were obtained here, such as *Uracanthus albatus, U. discicollis, U. strigosus*, U.sp.; *Triticosmia paradoxa, Eroschema poweri*, and Atesta, sp.

Up on the sand ridges the Hakea was coming into flower, and on this we took *Stigmodera jekeli* and *S. robusta* (?) *Stigmodera attricollis* was taken from Hakea and Leptospermum. From a small Cassia I shook three specimens of a weevil "new" to us—*Evas crassirostris*, Pasc., previously recorded from South Australia only. Shrubs of several species were persistently shaken, as it was thought they must produce something; but in several cases without result. A number of young "Ming" trees were shaken in the hopes of getting one of the species of *Curis* that have been taken on this plant, but the only result in each case was a shower of small weevils.

In the big sand-ridge country, half a mile from the Siding, there are plenty of kangaroos, and their tracks were to be seen in every direction. Birds were more numerous here than on the flats, but I do not remember seeing any species that is not known down south, with the exception of the Lowan, *Leipoa ocellata*, and the Crested Bell-bird, *Oreoica gutturalis*. The latter, of course, was heard everywhere. On the edge of

the sand-ridge country were a number of nests of an ant, *Euponera lutea*. They were searched diligently, but did not produce much material. Crickets and cockroaches could have been had in plenty, but a shortage of bottles prevented the collecting of these, or spiders, in any number. The only beetles taken with this ant were *Eupines flavoapicalis*, Lea., *Tmesiphorus formicinus*, Macl., *Rybaxis electrica*, and *Calodera*, sp. While in a nest of a small black *Iridomyrmex* I found a real prize, *Extrephekingi*, described from Western Australia, but previously taken, one specimen each, by Messrs. H. W. Davey and J. C. Goudie, at Sea Lake, Vic. This little beetle belongs to the Ptinidæ, and is of a reddish chestnut colour, with a broad, jointed antennæ. Another good find was the Ptinid, *Polyplocotes carinaticeps*, Lea, in the nest of the ant *Cremastogaster læviceps*. This beetle was also described from Western Australia, and is now first recorded from Victoria. Two other good inquilines that were taken with *C. læviceps* were *Articerus cremastogasteri*, Lea, and *Nepharinus goudiei*, Lea.

In a nest of the Wood Ant, *Iridomyrmex nitidus*, I obtained a species of *Articerus* which I had long wished to possess—*A. constricticornis*, Lea, a small Pselaphid, with a single (visible) joint to the antennæ. This one joint is of a remarkable shape, being constricted in the middle, but the outline varies with the surface and angles from which it is seen. Not far from this nest I took another Pselaphid new to science, *Neopalimbolus goudiei*, Oke (M.S.S.). It is close to *Palimbolus*, but the maxillary palpi differ in being longer, with the joints thin at their base. The male is without armature on the legs, which also is at variance with the described species of *Palimbolus*.

Tuesday evening rain began to fall—a passing shower, we thought—but it was after 8 a.m. next day before we could leave our tent. Steady rain all night, and we had only a light calico tent and our umbrellas. These latter we put up in the tent, and they kept us dry for some time. However, before 10 p.m. I was damp, and an hour later wet! Rain had filled the channels all around the tent, and I thought that we would float off, but morning found us still there, and the sun breaking through the clouds. That evening, as it threatened to rain again, we struck tent and made a camp under a tarpaulin from one of the trucks. It was well that we did so, for rain fell incessantly through the night. We determined to leave Gypsum, and 4 a.m. found us packing up. We caught the morning train for Hattah, which is 36 miles further on. Arriving, we were surprised to find that here

there had been only a light, misty rain, but, as it looked rather threatening, we decided to stay near the station for a couple of hours. I made off down the line to a patch of scrub, and was soon digging out a *Carenum* burrow, whose occupant proved to be *C. elegans*.

Under a small stone I found a nest of *Iridomyrmex* sp., and was fortunate to get two specimens of a new Ptinid, which I have named *Polyplocates apicalis*, Oke (M.S.). It is rather like *Diplocates foveicollis*, Oll., in the body, but the antennæ has only 9 joints, and the eleventh is very large. Not far away, in another nest of the same species of ant, I caught two specimens (♂ ♀) of *Diplocates* (*Decemplocates*) *strigicollis*, Lea. This beetle has only 10 joints in its antennæ.

About 10 o'clock we started to walk out to Lake Hattah, a distance of 3½ miles. Some very interesting country lies between the Hattah Station and the Mildura Road, and it was only by the promise of a full day along this track (a promise not fulfilled) that I was persuaded not to wander off into the scrub. However, a little collecting was done. The results were rather disappointing, the only beetle worth taking being a specimen of *Relus flindersi*. There is a great variety of vegetation here, and this should be good insect country all the year round, but especially in the early spring, when the various Acacias are in bloom. The only shrubs we found in flower were three species of Mallee and *Myoporum platycarpum*. Several bushes of this latter species were shaken into the umbrella, but the only beetles obtained were *Monolepta divisa*, Blkb., *M. modesta*, Blkb., and *Ditropidus apicipennis*, Lea.

It had been arranged that we would stay with Mr. Alf. Jones, a friend of Mr. Dixon, who is the only resident right on the lake, with the exception of Scotty at the pumping station, which supplies water to the railway station and residents in Hattah. When we were there Mr. Jones had his camp almost within a stone's-throw of the water in Lake Hattah. On the other side of the camp Lake Brockie was only a few hundred paces away, and, straight in front, about a quarter of a mile, was Little Hattah. In dry weather they are distinct lakes, but in flood are all joined together.

Around the lakes is a fringe of River Gums, and on the flat between and around Lake Brockie are a few Black Box, but these, like most of the vegetation, seem to be dying out. This is particularly the case with the Hop Bush and the Moonah. Of the latter only a small clump of six or seven fair-sized bushes remain; of the former, not a bush was found near the lakes, and yet both species grew plentifully a few years ago! Is it not the same everywhere? The vege-

tation is killed, and no young shrubs or trees grow to take the place of those destroyed. The beetles collected at Hattah might be divided into four groups: (1) Those taken at the water's edge; (2) those taken on the flats around the lakes; (3) those taken out in the Mallee scrub; and (4) those taken in ants' nests.

Naturally enough, after the dryness of the Gypsum sand-ridges, the water attracted us at Hattah, and we spent one first day as well as several half-days there. As was expected, the most numerous in species and individuals of the beetles were Carabs. Some kinds well known around Melbourne were among the most abundant here, viz.: *Platynus marginellus*, Fr., *Chlaenius australis*, Dej.; *Mecyclothorax ambiguus*, Er.; and *Catadromus lacordairei*, Boisd. Other species common enough here, but unknown in the Melbourne district, were *Rhytisternus limbatus*, Macl.; *Chlaeniodius mellyi*, Montry.; *Pheropsophus verticalis*, Dej.; *Catadromus latro*, Tsch.; and *Bembidium jacksoniense*, Guer., while only one or two specimens of the following were taken: *Eutheneus murrayensis*, Blkb.; *Amblystomus ovalis*, Sl.; *A. parvus*, Blkb.; *A. lactus*, Blkb.; *Mecyclothorax curtus*, Sl., *M. punctulatus*, Sl., and *Loxandrus australiensis*, Sl. A few Staphylinidæ were taken along the water's edge, including *Aleochara semirubra*, Fvl.; *Philonthus subcingulatus*, Macl.; *Thayeocephalus chalcopterus*, Eriehs., T. sp., nov., *Pinophilus aniventris*, Fvl., 5 sps. of Lathrobium, 5 sps. of Scymbalium, and *Domene torrensensis*, Blkb., not hitherto recorded as Victoria. Water-beetles were scarce, and only four sps. of Hydrophyllidæ were obtained. Pselaphidæ also were scarce, and only four species were taken: *Eupinoda sp.*; *Ctenisophus longicornis*, Lea., and two other undetermined species.

Several of the forms mentioned were found only at one point—on Lake Brockie—where mild flood conditions existed. Had we collected at this point on our first day we would probably have done much better than we did. As it was, we tried for a while on the second day, and gave it up as the day was too windy. I did not try there again until the day before we left, and by then the beetles were considerably reduced in numbers. I think this was due, principally, to the number of Geckos and Scorpions that had concentrated around this spot. Every stick or piece of bark seemed to be harbouring at least one scorpion. Under one piece of bark, about 18 inches in length and five or six inches in width, there were seven of them. They were a fairly small species, of a dingy, yellowish colour, variegated with black spots, and were probably *Isometrus maculatus*, De Geer.

In the next group—those taken on the flats—Carabidæ was well represented here also. The largest species found

was *Philoscaptus tuberculatis*, Macl. This is a very fine insect, 1¼ inches in length, jet black, with rows of small tubercles on the elytra. The jaws are very powerful-looking, and the front legs are well adapted for digging. It is usually found sitting in the entrance to its burrow, which is only four or five inches in length, under logs. Two specimens of *Geoscaptus cacus*, Macl., a brilliantly-polished species, somewhat like *Carenum scaraphites*, Westw. Undoubtedly the most showy Carab we found here was *Eutoma tinctillatum*, Newm., of which we secured several specimens in two distinct sizes—20 mm. and 14½ mm. Looked at from one angle these specimens are of a beautiful violet hue, but when seen from another angle they appear a bluish-green.

The rarest find in Carabs for the trip was *Trichocarenum castelnaui*, Sl., a single specimen of which I found sheltering under a chip of wood—without a sign of a burrow. This interesting species was described as from Roebuck Bay, Western Australia, from a single specimen in the French collection, and my specimen is, apparently, only the second one to be taken. A specimen of *Mecyclothorax lateralis*, Cast., was taken under some rubbish, as also were some *Simondantus mandibularis*, Sl. Two species of Paussidæ were taken—*Arthropterus wilsoni*, Westw., and *A. westwoodi*, Macl.—under cover on the ground, but never in ants' nests. The latter species was not uncommon, and one was taken in the scrub, two miles away from Lake Brockie. A few interesting species of Tenebrionidæ were found occurring on these flats, including species of *Pterohelæus*, *Helæus*, *Saragus* and *Adelium*, *Hypaulax orcus*, Pasc., and several species of *Chalcopterus*.

Another good "find" I made here consists of a pair of *Metriorrhynchus apterus*, Lea. They were taken on a log, and on opening up the log several pupæ were obtained. Unfortunately these did not emerge properly. This interesting insect is, as its name implies, wingless in the ♀. The ♂ is, I believe, still undescribed. I obtained a single ♂, which may belong to this species, as it was taken near this log, but it is winged. This species was described as from the Darling Downs, in Queensland, and I am not aware of its having been taken elsewhere, so this is an interesting extension of its habitat.

The Black Box was well worked, and several nice weevils were obtained from it, including *Ozyops bilunaris*, *O. alphabetica*, Lea., *O. sp.*; *Bryochus squamicollis*, Pasc.; *Rhinaria tibialis*, Blkb.; *Haplonyx spenceri*, Gyll.; *H. fasciculatus*, Bok., and a variety of *H. sp. nov.*—structurally near *longipilosus*, Lea. The River Gums were much too high for us

to discover what might be on the foliage, but every piece of loose bark within reach was stripped off. The only beetle that was at all common here was *Diphobia familiaris*, Oll., and they were both with the ants and under bark, or on the ground by themselves. A few Carabs were taken, but very sparingly—*Adelotopus cylindricus*, Ch.; *A. aphodioides*, Westw.; *A. micans*, Blkb.; *Sarothrocrepis sauvis*, Blkb., and *Anomotarus minor*, Blkb. Amongst other families were a Clerid, *Lemidia rufa;* a Chrysomelid, *Monolepta arida*, Lea., and a Ptinid, *Ptinus sp.*, near *mediolaber*, Lea.

Only three trips were made back into the Mallee scrub proper one being to some large sand ridges about two miles away; the second, around and beyond the pumping station and out onto the Mildura road; and the third to some paddocks that had been "rolled," and then left. This latter was a most interesting day's collecting. As the morning was bright and warm, an early start was made, the way being over the undulating land, covered with white everlastings, towards the Mildura road, up the slope to "Wilson's Selection," through the Pine and Bull Mallee belt, and on into the scrub. Though the idea was to get to the rolled paddocks as quickly as possible, and not to loiter on the way, we had not left the camp three minutes before a log was noticed that had not been turned over, and, of course, we could not resist the temptation of having a look underneath it. And so it continued. A specimen of *Eutoma tinctillatum* under one log, a *Helocus* under another; perhaps a Termite's nest, or a nest of some ant would be revealed and searched through for "guests." Here, in a Termites' nest, I found a few specimens of an apterus Staph, belonging to the sub-family Aleocharinæ, which, Mr. Lea informs me, is vivaparous. It is a pretty little thing when alive, with its head, prothorax and elytra a dark wine colour, and the abdomen and appendages much lighter. It is very quick in its movements, and is apparently on the best of terms with its hosts. It is probably new to science, but has not yet been fully worked out.

On the rise are some Myalls, and from these a few weevils were obtained, while the leaves underneath were smothered with a small species of ladybird. Every few steps there was something to do: a log to be turned; some bark to be stripped; some boughs on the ground to be shifted; or some bushes to be shaken into the umbrellas. That nothing may escape being taken, a collector has to try everything, and every way he can think of. Here, and in other parts, we found quantities of a Mallee in flower, I believe, the Yellow Mallee, *E. incrassata*, on which hardly a beetle was to be found. The Mallee in question has large clumps of flowers, which are of

a decided yellowish colour, and the individual flowers, as also the leaves, are rather larger than usual. The flowers emit a strong, overpowering smell of honey, and, after beating a quantity into the umbrella, the inside surface becomes so sticky that it is necessary to wash the umbrella. And yet hardly a beetle, or bee, will go near the plants. I do not know the reason, but there must be something unpleasant in the taste of the nectar.

Shaking the shoots around the stumps of some Bull Mallee we obtained some nice Chrysomelides, *Cryptocephalus metallica*, Lea; *C. scabrosus*, Oliv.; *var. rugifrons*, Chp., *C.* sp.; *Cadmus histrionicus*, Chp., and a few species of *Paropsis*. While shaking a clump of shoots I obtained a pair of small weevils that I thought were "new" to me, and I spent over half-an-hour trying to get more, but only obtained one. Imagine my disgust when, later, I found that they were only the Grain Weevil, *Calandra granaria!* From a young piece of the white Mallee I obtained the green caterpillar of the rather rare moth, *Hyleora eucalypti*, and this was subsequently bred out. What a change in colour! The caterpillar is a beautiful eau-de-nil with a white stripe down the sides; the pupa black, and the perfect insect is a fine study in browns, which, on the forewings, are intricately interwoven; the hind wings are pearly white with yellow-brown margins.

On reaching the "rolled" Mallee we tried everything, though the "spring-backs" were our main objective, and from these we obtained some beautiful species of Paropsis. But how disappointing these beetles are! One we caught was a large species of a beautiful soft shade of green. Within a month it was a dingy yellow. Another with a green band around it, and red and golden markings faded too. It is a great pity that these beetles will not retain their colours. Here we obtained *Pterohelaeus thymaloides*, Macl., and three species of Longicorns—*Altestra angasi*, *Rebius filiformis*, and *Ischnotes bakewelli*. By one o'clock the sand had become so hot that it almost burnt the hand when touched. We decided to have lunch. For a drink we went over to Wilson's tank. It contained only a few inches of mud, so we selected the nearest approach to a shady spot that was to be found, and lunched without water.

A few stunted Myoporums and a little White Mallee were the only flowers we found on resuming work after lunch. On the former were a few Anilaria, and a single *Pseudoanilaria purpurcicollis*, which may be its usual time here, but some that we bred out of sticks at home did not appear till February. The *Leptospermum* was just about finished at Hattah, and what little was left had very few

Stigs. on it, and only one was added to our list—*Stigmodera gibbicollis*, Saund. About 4 p.m. a start was made for camp, and, striking through the scrub, we returned by a different route. On the edge of the scrub I took a specimen of that very interesting longicorn—*Microtragus mormon*, Pasc. This longicorn looks very like one of the short-snouted ground weevils that has grown long antennæ.

The fourth group of beetles—those taken in ants' nests—provided more interest and took longer to catch than might be thought by taking a casual look at our "catch." For though they are mostly small, there is usually something of special interest in each species. For example, take *Thorictosoma tibiale*, Lea, of which I collected a few specimens in nests of a small black *Iridomyrmex* in the sand-ridge country. This beetle, which is 2¾ mm. in length, belongs to the Tenebrionidæ, is without eyes and wings, and yet ranges from Geraldton, W.A., to Hattah and Natya, in Victoria.

Out in the sand-ridge country I obtained a few more specimens of *Mallecoda myrmecophila*, *Diplocoles strigicollis*, *Polyplocotes apicalis*, and another very interesting Ptinid, belonging to the Eetrephini, for which a new genus, or subgenus, will have to be created. And as the antennæ have only two joints, the second being wedge-shaped, I have called it *Ectrephes cuneiformis* (M.S.S.). I consider this to be one of the most interesting species of Ptinidæ known in Australia. Though it might be a moot point whether the broadening of the joints—as in *Paussaptinus*—or the reduction of the joints from the usual eleven to two, as in the present species, is the more interesting. An intermediate position is occupied by *Ectrephes kingi* having the broadened antennæ, but only five or six joints. *Articerus* were scarce at Hattah, but two specimens, (♂ ♀) of *A. dentipes*, Lea, were found with *Iridomyrmex rufoniger*, and several specimens of another species, not determined yet, but certainly new to Victoria.

On starting for this trip I determined to try to obtain two beetles that had been collected in North-western Victoria —*Pheidoliphila carbo*, taken at Sea Lake from a nest of Pheidole, and *Camponotophilus fimbricollis*, described from Beverley, W.A., of which Mr. Dixon had already obtained two specimens in nests of the common Sugar Ant, *Camponotus nigriceps*, at Hattah. Of the first, no sign was seen, though no effort was spared. Pheidole Ants were rather scarce, but those nests found were looked over most carefully and revisited several times.

Hunting for the second species proved the most interesting item of our whole programme. The ants swarmed over everything all around the lakes, and every bit of cover that

did not have a nest of some other ant under it, had a nest of these Sugar Ants, but it was not till the fourth day of our visit that I succeeded in finding one of the beetles. I had looked in 236 nests without finding a specimen! When I say nests, I do not mean that all were separate colonies. For instance, two pieces of bark lying on the ground, say a few feet, or even less, between, and covering numbers of these ants and the tunnels leading down to their nests, would show on the surface, no connection whatever, but underground would almost certainly be linked. Yet I would have counted these as two nests. And, again, some nests were looked in twice, a few three times, and these visits were counted in. However, on turning over a piece of wood, and exposing my 237th nest (we had both looked in this nest, but on different occasions), I was at last rewarded by seeing one of the long-coveted beetles.

Camponotiphilus fimbricollis, or, to give it its English equivalent, The Fringed-neck beloved of the Sugar Ants is a dark-reddish, chestnut beetle, slightly under half-an-inch in length, with a fairly conspicuous fringe of pubescence around the pronotum. Victorian specimens are slightly larger than the only two specimens I have seen from Western Australia. Mr. Lea gives the length as 8½-9½ mm.; my examples are 10½-11 mm. That the beetles live on very friendly terms with their hosts there can be little doubt, as the ants made no attempt to molest them. When nests are opened, the beetles are very lively, and immediately make for the tunnels. In their hurry often they will try to run between the legs of their hosts, resulting in the ants coming "croppers," which the ants apparently take in the spirit of "no offence meant." The ants often get out of the way of the beetles, and seem as anxious as the beetles themselves are to get out of sight.

Twice, on finding one of these beetles in a nest, and noting which hole it was making for, I plugged the hole, an inch or two down, with my trowel. The beetle dived into the hole, but could not get down, and then there was excitement! Several ants rushed into the hole, pushed their way around, came out, looked around, as though for fresh inspiration, and then rushed back again. Did they push the beetle out? Or did it come out of its own accord? On the first occasion I thought the beetle rushed out of its own free will; it ran towards another hole, when I picked it up and put it in the killing-bottle. On the second occasion it appeared to me that the beetle was forced out by the ants and directed towards another hole, in much the same way as a dog will drive sheep. Only, instead of one dog and many sheep, it was several ants and one beetle. I tried to

PLATE VIII

THE BAW BAW BERRY, *Wahlenbergia saxicolaeformis*, F.v.M.

ALPINE HEATH, *Epacris Baeuerensis*, Stapf.

(Negatives by F. J. Bishop)

block the second hole, but the beetle was too quick for me. I tried to dig it out, but, on digging a small hole, such a labyrinth of passages were exposed that I was at a loss which way to proceed, and, as the clay was very hard for a trowel, I gave it up.

The time spent on opening the nests, before the first "Fringe-neck" was found, was by no means lost. Far from it! For other inquilines were seen and noted. Two other beetles were seen in the nests. One was a Staph., belonging to the genus *Conosoma*, but, as some specimens were obtained away from the nests, they may not be true inquilines. The second was a "new" Pselaphid, since described as *Tmesiphorus camponoti*, Oke. This species was not uncommon, but not many were taken, as I mistook it, in the field, for *T. formicinus*, Macl.

An unexpected guest to me, if not the ants, was a pretty little bluish spider, belonging to the family Attidæ. Numbers of this spider were seen by both of us, but neither saw one outside of the Sugar Ants' nests. Several kinds of mites were noted, and a small yellowish fly was not uncommon. But the most interesting and peculiar guest was a kind of Froghopper (Cercopidæ). All the species of this family hitherto known to me live on bushes, principally young Eucalypts, and live on the juices of these plants. Two species of this family, *Eurymola distincta*, Sign., and *E. rubrovittata*, Am., are very common on young Eucalypt trees, where they are always attended by ants, particularly the Sugar Ants and Meat Ants, *Iridomyrmex detectus*. But we found this species living in nests under the ground, and, from what we saw, it seems very doubtful whether they ever leave the nests, except, perhaps, to change from one to the other. The insects were found in all stages, except the eggs. Little larvæ from slightly more than 1 mm. up to fully matured imagines were seen in the same nest, and the ants guarded them so carefully it would appear that they spent their lives in these nests—unless they are taken out at night to feed on the trees. Unfortunately, our acetylene lamp was damaged, being dropped off the train at Gypsum, and I was unable to do much observation work at night. I did glance around one or two nests at night, but did not see any froghoppers outside them.

That these froghoppers are used to being carried by the ants is evident. On rolling over the covering log from one of the nests sometimes a dozen or 20 of these guests will be revealed. They seem to be greatly agitated, and quite unable to make up their minds which way to run. Any ant meeting one of the guests will immediately seize it by the thorax and carry it down one of the holes. Or, if the